Vol. 5 June 1941 No. 2

The EXTENSION ENTOMOLOGIST

AGRICULTURE'S PART IN TOTAL DEFENSE

The marshaling of our resources to meet this threat means more than the forging of cannon, the building of ships and planes, and the arming of soldiers. It means the ordering of our affairs so that our people will hold fiercely to the belief that the American ideal is worth defending.

This American ideal means different things to different people, and no one would have it otherwise. That is a thing we cherish about our way of life--we give the other fellow room to disagree--provided that disagreement does not imperil the safety of all. The American ideal holds sacred every man's right, within the limits of democracy and fairness, to speak, write, vote, and worship as he thinks best. The American ideal includes a decent opportunity to make a decent living.

Additionally, it is our duty to study and understand the situation which makes the defense program necessary, to know what total defense involves, and to keep acquainted with the progress of the defense effort.

Defense and Agriculture Series--No. 1,
October 15, 1940. Claude Wickard, Secretary.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

CONTENTS

UNITED STATES DEPARTMENT OF AGRICULTURE

Washington, D. C.

THE EXTENSION ENTOMOLOGIST

Issued by the Extension Service and the Bureau of Entomology and Plant Quarantine cooperating with other Federal and State agencies in the furtherance of extension work in entomology.

M. P. Jones
Senior Extension Entomologist

ANNOUNCEMENTS

August 17-21, 1941. Rocky Mountain Conference of Entomologists. Cameron Pass Camp, Colo.

PERSONNEL

North Dakota. Mr. F. Gray Butcher, extension entomologist, was on leave December 20, 1940, to February 5, 1941, in order to complete work for his Ph. D. at Cornell University. The degree was conferred upon him February 5, 1941.

Nebraska. Effective July 1, 1941, Mr. O. S. Bare, who formerly devoted full time to extension entomology, will divide his time between resident teaching and extension, and Mr. Don B. Whelan, who formerly divided his time between resident teaching and extension, will devote full time to extension entomology.

Utah. Dr. George Knowlton, entomologist with the State Experiment Station, devoted full time to extension entomology during May and June because of the pressing insect problems, especially the pea weevil.

THE FOOD FOR DEFENSE PROGRAM[1/]

By Claude R. Wickard
Secretary of Agriculture

Defense and agriculture.

This Food for Defense program was not developed overnight in Washington. It is the result of hours, days, and weeks of planning, discussing, and conferring.

Just a few days ago I called into my office the people in high administrative positions in the Department and told them that the Number One job from now on is this defense effort. I told them that the country has a right to expect this; that there might be some things that our officers in the Department thought were very important, some project they had started years ago, that might suffer for a time, but that the Department of Agriculture has the responsibility of seeing that the defense efforts, some of the things I have been talking about, always receive preference over everything else. I didn't mean everything else has to be dropped, but defense has to be taken care of first.

It means we have to redouble our efforts and work harder than ever to make our due contributions to the defense effort. It is sometimes a little difficult for us to visualize what this struggle is, anyway - what we are trying to do. War in North Africa or the Balkans doesn't mean much to someone in peaceful Nebraska or Missouri or Michigan.

What do we mean by defense? Defense of what? What are we trying to defend? Why should we produce more hogs or more eggs, more butter or anything else? It isn't all for somebody else; a lot is for our own people. We have never had enough of a lot of these things. What we want to realize is that we are in a struggle, although it is far removed from continental America. We are in a struggle to preserve American ideals. There is a conflict in the world because American and other democratic ideals are hated by the dictators.

In this war, food will be more important than guns. I believe that. Some people haven't realized it yet. As I said, when a man is pointing a gun at you, you are thinking about another gun rather than something to eat, but maybe the way in which you can handle that gun depends upon how much you have had to eat and how much the people supporting you have had to eat.

It is up to us to produce Food for Defense and reserves of Food for Peace.

1/ Excerpts from talk given at meeting of Extension and A. A. A. workers in Chicago, Ill., April 16, 1941.

DEFENSE AND EXTENSION ENTOMOLOGY

How many of us have time to think of the ways in which the National Defense program may affect our work and what we should be doing to meet the situation when it arises? During the past few months there have come to my attention several ways in which our work may be affected. Some of these are mentioned without discussion.

How long will our present supply of imported insecticides last?

With normal shipping space directed to the shipment of defense materials, how much will imports of certain materials be reduced? (Some have already been reduced more than 35 percent.)

What effect will shipments of defense materials have on the movement of larger supplies of insecticides within the country?

How much will our domestic output of insecticides be affected if certain chemical and manufacturing plants are used for the manufacture of munitions and armaments?

What adjustments can be made in case the prices of certain insecticides advance?

What about the availability and cost of dusting and spraying equipment, both hand and power?

How will our programs be affected by the loss to defense industries, or the armed service, of the following persons with whom we have been working?

Research workers on whom we rely for recommendations.
Related specialists with whom we cooperate.
County agents.
Local leaders.
Cooperating demonstrators (orchardists, livestock men, and others).
Farm laborers (trained spray operators).
Dealers in insecticides and their help.

What will be the effect of the Government's requested increased plantings of certain crops, such as tomatoes, 50 percent, dry beans, 35 percent; also string beans, peas, sweet corn, and possibly others?

What changed conditions will be encountered by the increased production of livestock and poultry, as requested by the Government?

How many people will be planting gardens or certain vegetables or small fruits for the first time under the home production of food program, and who have little knowledge of the insects they will encounter?

With even greater storage of food, what will our problem be?

How much will these programs step up the consumption of insecticides?

What are we doing to meet these situations?

EXCERPTS FROM ANNUAL REPORTS

PLANNING FOR EXTENSION ENTOMOLOGY

Farmers, county agents, and specialists were consulted in planning the year's work. Also, the reports of county and State planning committees were studied in order that selection might be based on the most important phases of agricultural problems.

Specific examples could be cited where planning committees are crystallizing sentiment and fostering action on important pest problems. This type of guidance is going to make for better control of pests.

--Annual Report, Colorado Extension Entomologist, 1940.

COORDINATION IN ENTOMOLOGY EXTENSION

No great changes have occurred during the past season. However, there is a gradual trend in the direction of a more coordinate entomology program in relation not only to other extension projects but also to the work of other Federal agencies in the agricultural field.

A beneficial program of coordination between the college faculty, experiment station workers, and extension made nice progress during the past year. The importance of this set-up is that recommendation in entomology for the field can be made on the basis of relationship to other agricultural activities as well as to specific control of the particular pest involved. Many entomology recommendations can be so planned that not only the specialist of the entomology project is making them, but we gain added assistance by having them repeated by other project matter specialists because they are interwoven with their projects. For example, renovating alfalfa is a good cultural practice in grasshopper control. It is also a good agronomic practice. This point carried to the field by both the agronomy specialist and the entomology specialist certainly gains emphasis.

Practically every phase of the entomology project ties up with some field of several other specialists. We are awake to this opportunity for extending the scope of effectiveness of the entomology project and making every effort to coordinate field activities to the highest possible degree.

Some time ago it was found that it was impossible to work with individual farmers, and that work must be with farm groups. Now we are confronted with the difficulty of working with individual county agents. Apparently the only alternative is to prepare county agents in advance to conduct such work in the absence of the specialist. We must reach them through group meetings to a greater extent than in the past.

The agricultural college each year is acting as a meeting place for additional farm groups such as the seed Dealers, and canning companies, necessitating an increasing number of meetings in which the Experiment Station and Extension Service personnel must unite to form effective programs.

--Annual Report, Colorado Extension
Entomologist, 1940.

EXTENSION NUTRITIONIST AND EXTENSION ENTOMOLOGIST COOPERATE

This program deals with practical controls for the insects that are a factor in the farm food supply. In cooperation with Inez M. Eckblad, extension nutritionist, insect control recommendations were supplied for the leaflet entitled "Feeding the Farm Family." Meetings were held in cooperation with home demonstration agents, and best methods of controlling garden insects were outlined. To encourage the gardener to have material on hand at a minimum cost, a gardening kit was suggested which was comprised of the following material, which a budget of $2.25 will buy:

Dust gun.....	$0.25
4 pounds of rotenone dust.....	0.55
Liquid sprayer.....	0.50
5 ounces of Black Leaf Forty.....	0.95
Total cost.....	$2.25

If you have $2.75 to spend for insect control, add 50 cents for zinc arsenite, which is used for flea beetles. If you have $3 to spend, add 25 cents for sulphur.

--Annual Report, Colorado Extension
Entomologist, 1940.

DISCUSSION GROUP MEETINGS

Two discussion group meetings on Fruit and Vegetable Insects were held at Camden and Bridgeville; another, which included field crops, at Milford. Local dinner clubs and commercial companies urged farmers to attend these meetings and present their questions to the specialists. These discussion groups proved very interesting and were well attended; 300 being present. The county agricultural agent presided at the meetings and referred the questions to the proper specialist for answers.

-- Annual Report, Delaware Extension Entomologists, 1940.

ENTOMOLOGICAL SCHOOLS FOR COUNTY AGENTS

A successful and useful series of schools for county agents during the winter of 1939 created a demand for similar schools in 1940. Consequently, four district schools were held again in 1940, from April 2 to 12, one each at Moscow, Parma, Jerome, and Pocatello. The objectives of the schools were similar to objectives of the 1939 schools, as follows:

1. To acquaint the county agricultural agents of the State with insects of economic importance in their counties.

2. To discuss the type of injury caused by some major pests and their importance to agriculture in Idaho.

3. To discuss in detail the biology and control of some important pests of each district. Control of potato and alfalfa and clover insects were stressed in the 1940 schools.

4. To correlate recommendations for insect control in all the counties and to attempt to standardize these recommendations.

5. To discuss uses for newer insecticides and emphasize their value in insect control.

Follow-up meeting.

Following the schools in April, a district meeting was arranged for the southeastern district of the State on July 11 to 12. Its purpose was to demonstrate in the field during the summer the insects that had been studied in the laboratory during the early spring meetings. One meeting was held in the vicinity of Rigby, and the other in the vicinity of Pocatello. The agents of this district attended the meeting nearest their county. Insects and insect injuries were studied in the field by the two groups.

Value of such schools.

Events of the summer seem to indicate the value of the schools for county agents in that they are more able to handle insect "trouble shooting" jobs of their county without the constant assistance of the entomologists. Their better knowledge of their insect problems gives the agents more confidence in handling their insect problems and, therefore, these problems are discussed more freely with farmers of the county, which, discussions in turn, enlighten to a greater degree the person having difficulties with insects. One of the objectives of the program, therefore, is being reached; that is, more widely to disseminate insect information in the counties. The increased knowledge of insects on the part of the county agents seems to be reflected in less correspondence between the farmers and the entomologists and in more organized requests for information on the part of the agents.

Preparation of insects for shipment.

Demonstrations of methods of collection and preparation of insects for shipment for identification has resulted in materials coming to the entomologists for identification in better shape, resulting in more accurate and prompt identification by entomologists of the staff and in the materials being more readily accepted for identification, where necessary, to send them to specialists for identification.

District entomological schools should be continued for at least another year, if the county agent personnel remains reasonably constant; if not, they should be continued indefinitely.

--Annual Report, Idaho Extension
Entomologists, 1940.

TERMITES DISCUSSED BEFORE LUMBERMEN'S ASSOCIATION

The entomologist was invited to discuss the termite control before the Lumbermen's Association meeting held in Manhattan. The purpose of this discussion was to get more builders and carpenters interested in the control of the pest. There were 1,252 new buildings constructed termiteproof, and 1,470 old buildings repaired to protect them from termite injury.

--Annual Report, Kansas Extension
Entomologist, 1940.

INSECTICIDE DEALERS' SCHOOLS

This subproject was reinstated in 1940 at the request of several county agricultural agents. As in the past, the work was done jointly with Dr. J. H. Muncie of Plant Pathology. Dealers' schools were conducted in the lower peninsula, with special reference to general crop and livestock pests. In the upper peninsula, more emphasis was placed

on potato protection materials. The field work on this project involved 13½ days, besides some office time in the arrangement of dates and the preparation of material.

In arranging for the schools, each county agent was required to submit an enrollment sheet with at least 10 signatures of dealers requesting the school. Where the requests in one county were too few, combination meetings were arranged with adjoining counties.

The material presented covered common errors encountered in the field as well as general background information on materials. This was done with a set of true and false questions which usually provoked the desired opportunity for discussion of the technical points to be covered.

The "Bug Flash" service was continued to the listed dealers. To be sure that the list was a true one, the old list was solicited by reply card.

--Annual Report, Michigan Extension
Entomologist, 1940.

CONFERENCE WITH INSECTICIDE MANUFACTURERS AND PROCESSORS

A conference with insecticide manufacturers and processors was held at the College of Agriculture during December. It was the first one in the history of the institution, and was called so that the fruit and vegetable specialists in insect and disease could have a round-table discussion and understanding of problems of mutual concern. The vegetable specialist helped to call this conference and took part in its discussions. In one talk he recommended that the date of mixing certain insecticides should be placed on the container by the manufacturer, because the insecticide in question was known to lose some of its toxicity within a few months. It is worthy of report that one large manufacturer is now following this suggestion, and that others are likely to do so. It is felt that such labeling will help the vegetable grower to choose freshly mixed insecticides when making purchases, and that better control results will thus be procured.

--Annual Report, New York Extension
Entomologists, 1940.

4-H CLUB WORK

The extension entomologist served as discussion leader for 3 days at the 4-H Club Congress held at the University in September. He also attended two 4-H district camps and conducted camp tours on nature study. The assistant, J. J. Beougher, attended one district 4-H camp, giving instructions in insect collecting and mounting.

--Annual Report, Ohio Extension
Entomologist, 1940.

EXHIBITS FOR COUNTY AGENTS' USE

Forty-two exhibit boxes were prepared and placed in the hands of agents. Each box contained 50 identified species of injurious and beneficial insects. The box becomes the property of the county agent's office, and can be used as a basis for building up a large collection of insects of interest to the county.

--Annual Report, Colorado Extension Entomologist, 1940.

CHECKING STOCKS OF INSECTICIDES

In Bonner County, the entomologist visited various dealers in company with the county extension agent. During these visits, the stocks of the insecticides and equipment for application of insecticides were examined, and the insecticides and equipment were discussed.

This type of program seemed to arouse more interest on the part of the dealer than the general-meeting type of program did in southern Idaho and is, therefore, to be recommended over the general meeting.

--Annual Report, Idaho Extension Entomologist, 1940.

VEGETABLE AND TRUCK CROP EXTENSION PROGRAM

Continued progress is being made with the work of this subproject. Every county extension report contained proof of this fact. These reports showed that a total of 56,098, or approximately one-third of all farmers in the State, followed recommended practices in the control of vegetable insects.

Farm visits.

The entomologist visited 66 counties in the State last year and assisted with meetings, during which some of the time was devoted to control of insects attacking vegetable and truck crops. Fifty-two meetings were held - the total attendance, 1,819. In addition to subject-matter meetings held, information on the control of vegetable insects was disseminated by use of mimeographed letters, bulletins, news articles, and the radio.

Reading matter.

Six garden letters were prepared during the year, and all contained information on control of insects. Probably at least two copies of these letters reached every farmstead in the State during the year, making a total of more than one-half million copies of letters distributed, which gave timely information on this subject. More than 8,000 copies of the home garden bulletin were distributed. This publication,

of course, contained information on the control of vegetable insects. In addition to this material, the project leader prepared news articles which were distributed to the State press twice each month, and at least 12 radio broadcasts were prepared during the year.

Evaluating work.

County agents' reports did not contain data which gave a clear indication as to the cash value of this work. However, an estimate based on the total value of vegetable crops produced, under the supervision of extension leaders, and the damage caused by insects, would indicate a saving of more than $600,000 resulting from the use of recommended control measures.

--Annual Report, Alabama Extension Entomologist, 1940.

HORSE BOTS AND BOT-FLIES

Since this subproject was started in 1936, horse-bot control has been one of the most popular phases of extension entomology. The carbon disulphide capsule method of horse-bot eradication has been used exclusively and has been practically one hundred percent effective. Very few animals have been lost from the effects of this treatment, and in nearly all cases such losses have occurred where the treatment was administered by laymen. Throughout the entire program, every effort has been made to have all treatments given by qualified veterinarians.

--Annual Report Nebraska Extension Entomologist, 1940.

CANTALOUP AND WATERMELON INSECT-CONTROL DEMONSTRATIONS

Cucumber beetles, both striped and spotted, are extremely difficult to control, and many methods of control have been proposed. A demonstration was conducted on the Mesa Farm to test the comparative value of calcium arsenate and cryolite for the protection of seedling cantaloup plants. For this purpose a mixture of 10 percent calcium arsenate and 90 percent hydrated lime was used in comparison with a mixture of 33-1/3 percent cryolite and 66-2/3 percent talc.

A series of six plots, each containing two-fifths of an acre, were dusted with these two materials, each treatment being replicated three times. Both materials were applied with sufficient dosage to cover the small plants thoroughly with the dust. The first application was made as soon as beetles began to appear, which was only a few days after the plants came up. Two additional applications were made at weekly intervals to keep the new growth covered with dust, since the beetles began to accumulate on the new growth in the bud of the plant

about 5 or 6 days after each application. (After the plants are large enough to develop runners, the beetles apparently cause but little damage in most cases.)

From results obtained in this demonstration, there is apparently no difference in the effectiveness of these treatments. Both materials produced almost complete protection for the small plants, so long as the new growth was kept covered by the dust. The cost, however, of the calcium arsenate-lime mixture is only about one-third as much as the cryolite-talc mixture.

A commercial product containing pyrethrum and lethane was tested in a demonstration on the Fletcher Ranch north of Peoria in Maricopa County. Both squash and cucumbers were treated with this material, using a dosage of approximately 15 to 20 pounds an acre. Cucumber beetles were extremely abundant, and, 3 hours after dusting, approximately 95 percent of the beetles seemed to be dead. However, 24 hours later, most of the beetles had recovered and were back on the plants. Only about 2 percent of the beetles were actually killed.

A second test, on watermelons and squash, was made on the Mesa Farm. The dosage was increased to approximately 35 pounds per acre. In this test approximately 65 percent of the beetles were killed. Since this material cost 13 cents a pound and at least two applications would be necessary, the cost of such control would be prohibitive.

Consequently, the most economical control thus far obtained for Arizona conditions is 10 percent calcium arsenate and 90 percent hydrated lime, with at least three applications at intervals of 7 days.

--Annual Report, Arizona Extension
Entomologist, 1940.

FLORISTS' SERVICE LETTER

Beginning January 1939 the specialist collaborated with specialists in the departments of floriculture and plant pathology in preparing a monthly service letter for florists, called Facts for Florists. This consisted of three pages, one devoted to pest-control problems. It was made one of the regular service letters mimeographed at the college and distributed through the county agricultural agents. The subject matter deals with new developments and with timely suggestions on control practices. This service letter now reaches over two thousand florists and, judging by response, has filled a real need.

--Annual Report, New York Extension
Entomologists, 1940.

EVALUATING ORCHARD SPRAYING

In making the survey, 365 orchards were examined in 55 counties. These orchards yielded 3,084,215 bushels of apples or approximately one-third of the estimated State production, which was about 9,240,000 bushels. In 120 orchards where all the recommended sprays were properly applied, total insect damage amounted to 2.8 percent. But in 227 orchards where either the complete program was neglected or the application or timing was poor, the insect injuries averaged 24.6 percent. These orchards may be compared with 18 unsprayed orchards where insect damage was 66.5 percent.

Monetary losses in the 120 well-sprayed orchards, due to insect attacks, averaged $15,908. In the 227 orchards where spraying information suggestions were not followed completely, the insect losses averaged $240,933.

--Annual Report, Pennsylvania Extension Entomologists, 1940.

DIVISION OF TIME BY PROJECTS

Personal visits to orchardists were slightly fewer than in past years. There was, however, an increase in the number of visits in most of the other fields of entomology, as indicated in table 1, which presents data for the past 5 years.

Table I

Subject of visit	Percentage of total visits				
	1936	1937	1938	1939	1940
Fruit crop insects	49.0	47.0	46.0	52.0	41.0
Truck crop insects	1.6	2.0	1.3	2.2	6.4
Field crop insects	--	1.0	1.4	1.5	4.3
Insects of forest, shade trees and ornamentals	1.1	2.0	2.8	1.6	3.5
Household insects	3.3	2.0	3.8	5.6	6.0
Insects affecting man and animals	41.1	28.0	13.1	17.0	16.3
Beekeeping	0.9	12.0	17.0	9.4	10.4
Rodent control	--	--	--	0.9	3.5
4-H Projects	2.1	6.0	7.8	6.0	3.4
Miscellaneous	--	--	5.5	3.4	5.0
Total visits made	794	918	1,160	874	953

From these data it is apparent that people in Delaware, other than orchardists, are gradually looking to the entomology specialists for solutions to their insect problems. Owing to limited funds and the increased demands for more general insect information a reduction of visits in the field of fruit insects was necessary. In the last 3 years, correspondence has increased nearly one hundred percent over that of 1936.

--Annual Report, Delaware Extension Entomologists, 1940.

TIMELY TOPICS

FARMER'S ROLE IN DEFENSE

"With farm labor costs going up, just as farmers are sending their sons into the draft, farmers will need more machinery to help do the farm work. Farm machinery manufacturers have just knocked out competition for future years of interstate sales of prison-made farm implements and binder twine, with a new law of Congress taking effect in 1941. Farmers are likely to find machinery costs going up just when they are most dependent upon machinery. For many reasons, farmers have a greater stake now in Federal policies -- policies on labor, defense, industry, than ever before."2/

CRYOLITES FOR CONTROL OF BOLL WEEVIL AND THEIR EFFECT ON LEAF APHID POPULATION

Field plot tests were conducted by R. L. McGarr and assistants, at the State College, Miss., laboratory of the Bureau of Entomology and Plant Quarantine. Comparing cryolite containing different percentages of sodium fluoaluminate for boll-weevil control. Five effective poison applications of each treatment were made between July 27 and August 24. The cryolites were applied at an average rate of 10 to 12 pounds, and calcium arsenate at 6 pounds per acre. The results are summarized in the following table.

Treatment	Squares punctured by boll weevil	Aphids per square inch of leaf area	
		Maximum	Average
	Percent	number	number
Check	48.4	0.64	0.37
Cryolite, approx.29% Na_3AlF_6 & sulfur.	48.0	1.90	.82
Cryolite, approx.35% Na_3AlF_6 & sulfur.	42.5	2.40	1.01
Cryolite, approx.89% Na_3AlF_6	27.7	6.33	2.63
Calcium arsenate	15.3	8.97	3.93

2/ Farm Payments May Survive. Nebraska Farmer, Lincoln, Nebr., December 14, 1940. Vol. 82, No. 25, p. 7.

It will be noticed from the table that the cryolite containing approximately 29 percent Na_3AlF_6 gave no control of the boll weevil; the cryolite containing approximately 35 percent Na_3AlF_6 gave very little control; and the cryolite containing approximately 89 percent Na_3AlF_6 was only about half as effective as calcium arsenate. It will also be seen that where the cryolite containing approximately 89 percent Na_3AlF_6 was used, the aphid build-up approached that of the calcium arsenate, and that the increase in aphids following the use of the cryolite-sulfur mixtures was about in proportion to the quantity of sodium fluoaluminate contained in each.

METHYL BROMIDE UNSUCCESSFUL AS GRAIN FUMIGANT IN ELEVATOR BINS

R. T. Cotton, George B. Wagner, and T. F. Winburn, Manhattan, Kans., laboratory, Bureau of Entomology and Plant Quarantine, report that the fumigation of stored grain in elevator bins with methyl bromide has not proved successful, although several methods of applying the fumigant have been tested.

One method of application consisted of introducing the liquid through a ½-inch metal pipe running from top to bottom in the center of a bin 80 feet deep, supplied with openings at every 10 feet of depth. A second method consisted of applying the entire dosage at the top of the bin, but just below the surface of the grain. The third method consisted of introducing the fumigant in 1-pound cans that were tossed into the grain stream as the bin was being filled. Although dosages up to 3 pounds per 1,000 bushels of grain were applied, the kill of insects was incomplete in all cases.

To overcome difficulties of distribution due to the low boiling point of methyl bromide, arrangements were made to obtain a 15-percent mixture of methyl bromide in the commonly used ethylene dichloride-carbon tetrachloride mixture. Preliminary tests made with this mixture in bins of shelled corn containing 2,000 bushels, indicated that a dosage of 1½ gallons per 1,000 bushels applied to the surface gave excellent results.

SECOND GENERATION OF CORN BORER IN INDIANA AND OHIO

A. M. Vance, Toledo, Ohio, laboratory, Bureau of Entomology and Plant Quarantine, reports that data on midsummer pupation, indicative of a second generation of the European corn borer, were obtained during the fall infestation survey in August and September 1940 in 35 counties of Indiana and 43 counties of Ohio.

LIVE EUROPEAN CORN BORERS MAILED FROM CHINA INTERCEPTED

According to the Division of Foreign Plant Quarantines, on December 12 two sample packages of living larvae of the European corn borer (Pyrausta nubilalis Hbn.), one sent to a pet shop and the other to a goldfish company in San Francisco, were intercepted by a customs mail examiner.

A company in Tientsin, China, had sent the samples with a mimeographed letter stating that they were in position to furnish large quantities of these live "worms" for bird food from October to April at $1 a pound f.o.b. San Francisco, including packing, in lots up to 3 pounds. Shipments of more than 4 pounds were offered to be sent c.o.d.

A similar mail shipment was intercepted at Baltimore on December 17. Although these samples contained only about 20 larvae each, with corn-husk packing, 20 mature larvae could easily start a serious infestation if given an opportunity.

About 1 month later, four cans measuring about 3 inches in diameter and 4 inches in height, filled with larvae with their food material and consigned to a firm in St. Louis, were intercepted by Customs in that city. In this instance the insects were dead and, in most cases, decomposed.

These incidents further illustrate the cooperation continuously given by Customs personnel in efforts to stop the entry of destructive plant pests.

GRAPE COLASPIS INFESTS SOYBEANS

County Gentleman[3/] says that J. H. Bigger, of the Illinois State Natural History Survey, has discovered that the grape colaspis uses soybeans as a breeding ground and thus becomes the first insect to infest the crop. During the past year, this pest did widespread damage to thousands of acres of corn and soybeans in Illinois, and the outlook for the coming season is not bright. The best known methods for control at the present time are early spring plowing and the heavy disking of land that is to be planted to corn and soybeans.

LYGUS BUGS IN ALFALFA YIELD TO COMMUNITY CONTROL ACTION IN ARIZONA

V. L. Wildermuth and L. L. Stitt, Tempe, Ariz., laboratory, Bureau of Entomology and Plant Quarantine, report that serious reduction in yields of alfalfa seed, caused by feeding of Lygus bugs, on alfalfa florets, in the Mohawk and Antelope Valleys of southwestern Arizona,

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3/ New Soybean Pest. Country Gentleman, v. 111, no. 1, p. 48. January 1941.

led in 1939 to the adoption of a community control program which has proved highly successful. This program was arranged through the cooperation of the local alfalfa-seed growers, the Bureau of Entomology and Plant Quarantine, and the Extension Service of the Arizona State Experiment Station.

In accordance with an outline prepared by Messrs. Wildermuth and Stitt and C. E. Blackledge, county agent of Yuma County, the growers agreed to adopt uniform cultural action throughout the year, aimed at greatly reducing the numbers of Lygus bugs early in the season, and later exposing them to maximum solar heat and starvation by timely harvest of the hay crop preceding the seed crop. This program consisted of a combination of cleanculture, pasturing, and irrigation schedules, together with uniform harvesting schedules so timed as to expose the bugs to maximum summer temperatures.

In a seed-producing area of 4,600 acres, the growers cooperated practically 100 percent in adopting this outline during the seasons of 1939 and 1940, with the result that bug populations were greatly reduced and alfalfa-seed production rose from an average of 174 pounds an acre in 1938, to 314 pounds in 1940. Some fields, having unusually excellent stands, produced from 400 to 600 pounds an acre. A check on these results was afforded by the Lygus infested but untreated south Gila seed-growing area, some 29 miles distant. This area produced in 1940 only 171 pounds of seed an acre, and had a bug population per acre about five times as great as that present in the Mohawk area.

SEX OF COCKROACH INFLUENCES RESISTANCE TO PYRETHRINS

The toxicity to adult American cockroaches (Periplaneta americana L.) of pyrethrins dissolved in refined kerosene was investigated by E. R. McGovran and E. L. Mayer, Beltsville, Md., laboratory, Bureau of Entomology and Plant Quarantine, and they report that the female roaches were more resistant to the pyrethrins than were the males. The mortality of the females at double the concentration of pyrethrins, equalled nearly that of the male roaches, indicating that the females were approximately twice as resistant to the pyrethrins as the males.

DIPPING FOR CONTROL OF CATTLE GRUBS

Three groups of cattle were dipped in the standard sulfur-cube dip and in modifications of it to test its efficacy against cattle grubs. These tests were made by R. W. Wells, of the Dallas laboratory, Bureau of Entomology and Plant Quarantine. Clearly, about 40 percent of the grubs in cattle dipped once failed to survive the standard dip, while it was indicated less clearly that from two dippings a destruction of 75 percent of the grubs may be expected.

BUG CARRIES HORSE ENCEPHALOMYELITIS

C. H. Kitselman, of Kansas State College, reported recently to the American Association of Economic Entomologists that a bloodsucking insect that feeds on horses, mules, and other animals in the West carries equine encephalomyelitis, or horse sleeping sickness. He says that this constitutes the first case in which a neurotropic virus has been isolated from an insect in nature. In experiments, numbers of the insects which had been captured in pastures where horses had died of sleeping sickness were ground up, and a filtered, germ-free extract from their bodies was injected into guinea pigs. The guinea pigs developed symptoms of encephalomyelitis and died. The virus able to cause the disease in other guinea pigs was isolated from their bodies. The insect (Triatoma sanguisuga) is known in Kansas as the Mexican bedbug.

--(Science Service)

PHENOTHIAZINE REACTS UNFAVORABLY TO SOME HORSES AND MULES

Although phenothiazine has proved more efficient for removal of intestinal worms in horses and mules than any other known drug, poor, weak animals, and those affected with infectious anemia, are bad risks for the treatment, the Federal Bureau of Animal Industry said recently. Discovery of its efficiency, when given with the feed, has led to its use in nearly all parts of the country. Thousands of horses and mules have been treated successfully with phenothiazine to remove palisade and other intestinal worms, but some reports of deaths or other unfavorable reactions have reached the Bureau. Whether these have resulted directly from the drug, or from some condition previously existing in the animals, has not been determined.

STABLEFLY ("DOG FLY") LARVAE BREEDING PLACES

In his report for the last quarter of 1940, W. E. Dove, Panama City, Fla., laboratory, Bureau of Entomology and Plant Quarantine, tells of the discovery of infestations of "dog fly" (Stomoxys calcitrans L.) larvae and pupae in peanut litter in the fields throughout the principal peanut-growing section of northwestern Florida, southeastern Alabama, and southwestern Georgia.

The breeding occurred in fermenting waste, leaves, and stems left in the field where peanut vines were baled for hay. After fall rains, the infestations were found in every pile of litter examined. The piles, about 25 by 30 feet, and ranging from 3 inches deep on the edge to 3 feet deep in the center, were found at the rate of about 1 to each 10 acres of harvested peanuts. In 10 counties of western Florida, 9 counties of southern Alabama, and 33 counties of southeastern Georgia it is estimated that 1,000,000 acres of peanuts were harvested in 1940, and that these resulted in about 100,000 piles of litter which are breeding, or are capable of breeding, outbreak numbers of dog flies

in that area. Mr. Dove states that in favorite locations there may be more than 100 larvae and pupae per square foot of litter.

Another and a different dog-fly breeding problem exists in drifts of marine grasses washed ashore on beaches of bays and sounds. The latter breeding occurs in different areas and at times when one would expect the breeding in peanut litter to be at a low point. In general, the months of July, August, and September are the dangerous months for breeding of dog flies in marine grasses, whereas breeding occurs in the wet peanut litter a month or two later.

INSECTICIDES TO CONTROL TURNIP APHID

Insecticides containing derris, cube, or nicotine will control the turnip aphid, a destructive pest of turnip, mustard, radish, and related crops, Norman Allen and P. K. Harrison, of the Bureau of Entomology and Plant Quarantine, say in a new farmers' bulletin[4/] just issued by the United States Department of Agriculture.

Turnip aphids cause heavy losses each year to commercial truck growers and farmers, especially in the South. Damage in Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, and South Carolina is estimated at $2,800,000 annually. Turnip aphids thrive in late fall, winter, and early spring, the best time for growing their favorite food plants. The aphids damage young plants or new growth of older plants by sucking the juices.

DETERIORATION OF CUBE MIXED WITH CARRIERS

N. F. Howard and R. A. Fulton, in reporting the results of an experiment conducted at Columbus, Ohio, laboratory, Bureau of Entomology and Plant Quarantine, conclude that there was no deterioration of the rotenone-deguelin content of ground cube root mixed with finely ground diatomaceous earth, Georgia talc, and hydrated lime, with sulfur, after these dust mixtures had been prepared and stored at room temperatures in stoppered, amber-colored bottles for 2 years.

They also found only slight deterioration in the rotenone-deguelin content when the ground root had been mixed with monohydrated copper sulfate-hydrated lime and stored under similar conditions for a period of 1 year. However, after being stored 2 years in glass Petri dishes in a greenhouse, the cube mixed with monohydrated copper sulfate-hydrated lime, hydrated lime, and Georgia talc, had deteriorated 20 to 35 percent, but the mixtures with diatomaceous earth and with sulfur had deteriorated only 15 percent.

The rate of deterioration of rotenone-deguelin in a cube-bordeaux mixture was found to be 50 percent after 3 months, 50 percent after 18 months, and only 55 percent after 24 months. All the dust mixtures

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4/ The turnip aphid in the Southern States and methods for its control. U. S. Dept. Agr. Farmers' Bul. No. 1863, 9 pp. Washington, D. C.

used were originally compounded to contain 1 percent of rotenone, being prepared from a cube-root powder and analyzed as containing 5.7 percent of rotenone and 24.5 percent of total extractives. The cube-bordeaux mixture originally contained 0.015 percent of rotenone; and was stored in a clear bottle at room temperatures. The amount of deterioration of the rotenone-deguelin content was determined at intervals during storage of the mixtures by the use of a colorimetric method of analysis.

NEW SERVICE FOR DRUGGISTS

"In cooperation with the office of the State association, the Oklahoma A. and M. College Agricultural Extension Service are offering a new service to the druggists of Oklahoma in furnishing them with the latest insect- and pest-control information available.

"An insecticide manual has been prepared by entomologists of the college, which discusses the most common insecticides, the insects controlled, the most commonly used formulas, and additional remarks about many insecticides.

"Some 600 druggists in the State requested copies of this insecticide manual, which was sent to them during the month of February. Additional information will be sent from A. and M. College from time to time, and local meetings will be held in drug stores for the purpose of discussing insecticides and insect control.

"J. Myron Maxwell, associate extension entomologist, is in charge of this service, which we believe will prove to be of great benefit to the druggists of Oklahoma."[5]

AGRICULTURAL INSECTICIDES

"Manufacturers of agricultural insecticides and dealers in these products have found the entomological departments of the various State agricultural colleges of big assistance to them in recent years, not only in developing and testing new products, but also in extending their sale through cooperative effort," says an article in Soap[6]. "Manufacturers of household and agricultural insecticides alike have both grown familiar in recent years with the work of the entomological department of Purdue University under the supervision of Prof. J. J. Davis. Besides sponsoring an annual Pest Control Operators' Conference, this department issues frequent bulletins dealing with insect problems and methods of control, copies going to manufacturers as well as users of both household and agricultural insecticides. Perhaps as a result of the stimulation of this original effort, the conference idea has spread to other States, and other universities have started a search for ways in which they might aid the insecticide manufacturer as well as the user.

5/ Oklahoma pharmacist. v. 6, no. 9, p. 7. February 1941.
6/ Agricultural insecticides. Soap. v. 16, no. 3, p. 95. March 1940.

"Insecticide dealers in the State of Delaware have just finished the first year of operation under a sales promotion plan in which they had the active assistance of the entomological department of the University of Delaware. The partnership as a matter of fact was actually initiated by the college authorities in an effort to develop a more intelligent and effective attack on insect pests affecting Delaware crops.

"For some time the college had been mailing two bulletins to Delaware farmers 'Orchard Spray Notes' and 'Vegetable Spray Notes,' giving advice on what to do when codling moths, oriental fruit moths, the plum curculio, and other pests appear. Insecticide dealers, it was felt, ought to be acquainted with these recommendations, too, and the college folks also decided that it would be desirable if dealers had a better understanding of the principles of insect control, together with a knowledge of the action of different poisons on insects.

"Insecticide manufacturers were appealed to and they cooperated by supplying the Extension Service with lists of dealers in their products located in Delaware cities. An assistant in the entomology department then contacted these dealers and provided them with bulletins and other information explaining the principles of insect control as well as summarizing control measures which research had proven to be most effective...."6/

A CERAMBYCID DESTROYING PRICKLYPEAR IN COLORADO

Specimens of a cerambycid beetle, identified by W. S. Fisher as Moneilema annulatum Say, were recently received from the Colorado State College accompanied by the report: "This insect is completely wiping out stands of pricklypear in pasture land in the vicinity of Fountain, Colo." Cactus stands in other parts of the State, however, appear not to be severely attacked.

PYRETHRUM BLOOMS HARVESTED BY MACHINERY

Mechanical harvesting of the flowers of pyrethrum plants is now possible with a machine developed after a 6-year study by the Federal Bureaus of Plant Industry and of Agricultural Chemistry and Engineering. From the dried flowers of the pyrethrum plant (a species of chrysanthemum), an important insecticide by the same name is obtained. Trial plantings in the United States have shown that although the pyrethrum plant is well adapted to many sections, hand methods of harvesting are too costly.

6/ Agricultural insecticides. Soap. v. 16, no. 3, p. 95. March 1940.

FULL-BLOOM STAGE BEST TIME TO HARVEST DEVIL'S-SHOESTRINGS

The changes in the insecticidal value of the roots of cultivated devil's-shoestrings (Tephrosia virginiana) at four seasonal growth periods has been studied by A. F. Sievers, M. S. Lowman, and G. A. Russell, of the Bureau of Plant Industry, in cooperation with W. N. Sullivan, of Control Investigations, Bureau of Entomology and Plant Quarantine.

In this work the clonal progenies of 10 parent plants of Tephrosia virginiana were grown under cultivation in northeastern Texas, to study the changes in the amount of rotenone and chloroform extractive present in the roots of such progenies and their toxicity to houseflies at four seasonal stages of growth. Two or more of the clonal progenies of each parent were completely removed from the ground at the dormant stage (January 26), the emergence stage (March 25), the full-bloom stage (April 26), and the mature-seed stage (August 6).

The roots were dried and ground, the amount of chloroform extractive and rotenone determined, and the toxicity of acetone extracts tested on houseflies. The results indicate that at the full-bloom stage the roots are significantly more toxic to houseflies than at the dormant and emergence stages, but their superiority over those at the mature-seed stage is less pronounced. The chloroform extractive and rotenone content is also highest at the full-bloom stage. The toxicity of the roots of the several clonal progenies of the same parent does not vary significantly, but significant differences were found in this respect between the progenies of different parents. The results of this work were published in the American Journal of Botany.7/

7/ Changes in the insecticidal value of the roots of cultivated devil's shoestrings (Tephrosia virginiana) at four seasonal growth periods. Amer. Jour. of Bot., v. 27, no. 5, pp. 284-289, illus. May 1940.

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